DRAFT
SOIL SAMPLING REPORT FOR REMOVAL ACTION OVERSIGHT WESTERN MINERAL PRODUCTS GLUEK PARK SITE - PHASE II MINNEAPOLIS, HENNEPIN COUNTY, MINNESOTA

SITE ID: B5P2
NPL STATUS: NON-NPL
TDD: S05-0003-0609-038

Prepared for

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region V
Emergency Response Branch
77 West Jackson Boulevard
Chicago, Illinois 60604

Prepared by

Weston Solutions, Inc.
20 North Wacker Drive, Suite 1210
Chicago, Illinois 60604

Date Prepared	March 29, 2007
TDD Number	S05-0003-0609-038
Document Control Number	038-2A-AAGW
Site-specific ID Number	B5P2
Contract Number	EP-S5-06-04
START Project Manager	Richard H. Mehl, Jr.
Telephone No.	(312) 424-3312
U.S. EPA On-Scene Coordinator	Sonia Vega

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Chicago, Illinois 60604

Prepared by: _____ Date _____
Michael A. Castillo, START Site Lead

Reviewed and
Approved by: _____ Date _____
Richard H. Mehl, Jr., START Project Manager

Reviewed and
Approved by: _____ Date _____
Pamela Bayles, START Program Manager

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LIST OF ACRONYMS AND ABBREVIATIONS

EOC	Extent-of-Contamination
ERRS	Emergency and Rapid Response Services
HHID	Household Identification
NIST	National Institute of Standards and Technology
NVLAP	National Voluntary Laboratory Accreditation Program
PE	Post-Excavation
PLM	Polarized Light Microscopy
SC	Site Characterization
START	Superfund Technical Assessment and Response Team
STAT	STAT Analysis Corporation
TEM	Transmission Electron Microscopy
U.S. EPA	United States Environmental Protection Agency
WESTON	Weston Solutions, Inc.
WMP	Western Mineral Products

1. INTRODUCTION

The United States Environmental Protection Agency (U.S. EPA) tasked the Weston Solutions, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START) with performing oversight and the documentation of asbestos bulk soil sampling for the continued Phase II removal action at the Western Mineral Products (WMP) Industrial sites, located in Minneapolis, Minnesota. This removal action was initiated to mitigate the threats posed by asbestos contaminated soil present at the WMP Industrial Facility and surrounding residential properties. The Emergency and Rapid Response Services (ERRS) contractor was Earthtech. The ERRS contractor was responsible for the management and performance of excavation and restoration activities in addition to the collection of bulk soil samples conducted at the properties.

Generally, the WMP Industrial sites targeted were residential properties surrounding the WMP Industrial Facility that had localized areas of surficial asbestos contamination, as identified through visual inspection and confirmed through laboratory analysis of surface soil samples. Most cleanup properties were identified within a 0.5-mile radius of the WMP Industrial Facility; however, cleanup properties were identified as far as 30 miles from the WMP Industrial Facility.

During the summers of 2005 and 2006, two target sites were addressed including a Park owned by the Minneapolis Park District and one residential property. Removal activities at the park, formally known as Gluek Park (hereafter referred to as Household ID [HHID] #322), were completed throughout both summers, while removal activities at the residential property (HHID #817) were only completed during the summer of 2005. This Soil Sampling Report describes sampling process design, soil sampling methods, sample identification, and sample documentation completed during this removal action. Brief summaries of analytical results and conclusions are also included within this report.

2. SAMPLING PROCESS DESIGN

Soil sampling at the two target properties during the 2006 removal action was completed to confirm

the type and amount of potential asbestos fibers to remain on site following excavation activities. Another purpose of soil sampling was to assess the actual or potential exposure pathways as indicated in the Conceptual Site Exposure Model (Attachment A).

Typically, contaminated areas at a remediated site are horizontally delineated by collecting soil samples from areas adjacent to visually confirmed contaminated areas and comparing the results to the project-specific U.S. EPA action level (set at non-detect for asbestos at contaminated properties (U.S EPA, 2000). This process was repeated until the extents of contamination were defined at each area. The horizontal extents of contamination at HHID #817 were defined in this manner. Soil samples collected during the summer of 2003 at the HHID #322 property confirmed the presence of surficial contamination throughout only a majority of the site (Site Assessment and Extent of Contamination at Gluek Park, WESTON, 2004). However, based on information from the 2004 Site Assessment Report, the decision by the U.S. EPA to excavate the entire property was deemed necessary.

The depth of excavation, where soil sampling was completed, at the HHID #817 property was determined in accordance with the procedures set forth within the START Residential Asbestos Remediation Work Plan (Roy F. Weston, 2001). The depth of excavation, where soil sampling was completed, at the HHID #322 was defined as two feet below ground surface throughout the property. The number and frequency of soil samples collected at target properties was determined at the discretion of the U.S. EPA ERRS crew member certified by the Minnesota Department of Health as an Asbestos Inspector.

3. SAMPLING METHODS

All soil samples were collected as bulk composite soil samples. Bulk composite soil sampling consists of collecting five sub-samples that were representative of a certain area. The five sub-samples were homogenized to reduce the number of analyses without sacrificing representativeness of the sample. A U.S. EPA ERRS crew member certified by the Minnesota Department of Health as an Asbestos Inspector collected the composite soil samples, and a U.S. EPA WESTON START

member provided documentation of the sampling activities including the sample location. Soil sampling methodologies were used in accordance with the procedures set forth within the START Residential Asbestos Remediation Work Plan (Roy F. Weston, 2001), the Western Mineral Products Site Phase II Soil Sampling Report (Roy F. Weston, 2001), and the Western Mineral Products Site Sampling and Quality Assurance Project Plan (Roy F. Weston, 2001).

3.1 Extent-of-Contamination (EOC) Samples

Typically, contaminated areas at a remediated site are horizontally delineated by collecting EOC soil samples from areas adjacent to visually confirmed contaminated areas and comparing the results to the project-specific U.S. EPA action level (set at non-detect for asbestos at contaminated properties). This process was repeated until the extents of contamination were defined for each area. The horizontal extents of contamination at HHID #817 were defined in this manner and were based on data results of eight EOC samples. A multitude of EOC soil samples collected during the summer of 2003 at the HHID #322 property confirmed the presence of surficial contamination throughout the majority of the site (Site Assessment and Extent of Contamination at Gluek Park, WESTON, 2004). However, based on information from the 2004 Site Assessment Report, the U.S. EPA opted to define the proposed excavation extents as the entire site. The number and frequency of EOC soil samples collected from a target property was determined at the discretion of the U.S. EPA ERRS crew member certified by the Minnesota Department of Health as an Asbestos Inspector.

3.2 Post-Excavation (PE) Samples

PE soil samples are typically collected from an excavated area to confirm the amount and type of asbestos to remain on site in that area. Five PE soil samples were collected at the HHID #817 property during the 2006 removal action activities. PE soil samples collected from the HHID #312 property were collected from a grid system composed of approximately fifty-by-fifty square foot grid areas. Five soil samples were collected from each grid. Exceptions to this pattern were influenced by either geographic limitations or partial grid excavations due to project time-constraints

3.3 Sample Identification System

All soil samples submitted for analysis were assigned a unique sample identifier. The sample identifier consisted of the following components:

Sample Matrix Identifier – A one-digit code to identify the matrix of sample collected. The code "S" corresponded to soil samples.

Analysis Method Identifier – A one-digit code to identify the analytical method used to analyze the sample. The codes "P" and "T" indicate polarized light microscopy (PLM) and transmission electron microscopy (TEM), respectively.

Sample Date Identifier – A six-digit code to identify the sampling date; the code consists of the month (two-digit format), day (two-digit format), and year (two-digit format).

Work Identifier – A two- or three-digit code to identify the work phase completed when the sample was collected. The codes "EOC" and "PE" were used to identify the samples relation to the specific work phase.

Work Site Identifier – A numeric code corresponding to the HHID of the work site.

Sampling Location Identifier – A code corresponding to the site-specific location and the alphabetic daily count of the samples.

For example, the sample ID ST-072106-PE322A is comprised of the following components:

S	–	Soil sample
T	–	TEM analytical method
072106	–	July 21, 2006, collection date
PE	–	Post excavation, work phase
322	–	HHID #322, work site
A	–	Sampling location A, sample count per day

3.5 Soil Sample Documentation

Soil sample description forms were completed for all samples. The description forms identified the date, time, HHID, sampling personnel, sample identification numbers, and a sketch of the area indicating all sampling locations. Examples of typical soil sampling forms used during the 2006 removal action are provided in Attachment B. During the 2006 removal action period, all samples were stored in a dedicated container until they were shipped to STAT Analysis Corporation (STAT), located in Chicago, Illinois, under chain-of-custody protocol. The chains-of-custody used during this

project are provided as Attachment C. STAT is accredited by the United States National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program (U.S. NIST NVLAP). STAT's certificates of accreditation are provided in Attachment D. The sample analyses complied with the Code of Federal Regulations, Title 40, Chapter I, Subchapter R, Part 763, Subpart E, Appendix A, Section II, as amended through October 30, 1987.

Photographic documentation collected throughout the 2006 removal action process by the U.S. START member is provided as Attachment E.

4. ANALYTICAL METHOD REQUIREMENTS

During the 2006 removal action, soil samples were analyzed by either the Polorized Light Microscopy (PLM) or Transmission Electron Microscopy (TEM) method. All soil samples were analyzed by STAT. A copy of STAT's TEM protocols is not provided in this report, however a copy of their TEM and PLM U.S. NIST NVLAP) certification is provided in Attachment E. Discussions of these analytical methods are provided below.

4.1 Polarized Light Microscopy

The PLM analytical method quantifies the presence of unidentified asbestos fibers as a percentage of total bulk material within a sample. This method is described in detail in *National Institute of Occupational Safety and Health Method 9002, Asbestos (bulk) by PLM*, provided in Attachment F. Both PLM and TEM (discussed below) soil samples were collected at the two properties. The number and frequency was determined by the Minnesota certified Asbestos Inspector. Based on the size of the HHID #322 property, four PLM soil samples were typically collected from each fifty-by-fifty foot grid area.

4.2 Transmission Electron Microscopy

The TEM sampling method identifies the specific type of asbestos fibers in a sample including: actinolite; amosite; anthophyllite; chrysotile; crocidolite; and tremolite. Typically, at least one PE

soil sample from each remediated property was submitted for TEM analysis to confirm the type and amount of asbestos remaining on site. Based on the size of the HHID #322 property, one TEM soil samples was typically collected from each fifty-by-fifty foot grid area.

5. ANALYTICAL REPORTS

All soil samples were submitted to STAT during the 2006 removal action at the HHIDs #322 and #817 properties. A U.S. EPA START member collected and compiled all analytical reports in both hard copy and electronic database formats. A summary of the soil analytical reports related to the two properties is provided in Attachment G.

6. SUMMARY

The 2006 removal action at the HHID #817 property included the excavation of asbestos contaminated soil from an approximate area of 100-square-feet and approximate depth of 6 inches. Five PE composite soil samples were collected from the excavated area and analyzed using both the PLM and TEM analytical methods. One sample detected asbestos fiber at a percentage of less than 1% while the remaining samples were non-detect.

The excavation of asbestos contaminated soil at the HHID #322 property consisted of an approximate area of 2.6 acres and an approximate depth of 2 feet. Typically, five PE composite soil samples were collected from each excavated fifty-by-fifty foot grid area and analyzed by either the PLM or TEM analytical methods at a ratio of 4 to 1, respectively. The PLM and TEM soil results of the excavated area at this property indicate asbestos fiber percentages ranged from non-detect to a maximum of 20% of the bulk composite soil sample. The specific detected asbestos fibers included tremolite or chrysotile. A detailed figure illustrating the grid areas and the maximum corresponding results at HHID #322 is provided as Figure 1.

7. CONCLUSIONS

The analytical soil results of the excavated area indicate that asbestos is present in soil above the site-specific action level set at non-detect for the two Phase II WMP removal action sites. Therefore, the subject soil is considered a hazard to health and public. The following discussion addresses the hazardous exposure route pathways associated with the soil and the action completed to prevent their completeness.

The potential exposure routes of the remaining asbestos present in the excavated areas at the HHIDs #322 and #817 property to the public include inhalation and ingestion. To prevent the completion of these exposure routes to potential receptors, including the public, the excavated area was backfilled and restored to pre-existing conditions with two feet of clean fill (as determined through laboratory analysis) over the entire excavation area. Furthermore, a geothermal liner was installed to serve as an indicator of where the excavation stopped. All soil removed from the two properties was secured in a truck lined with 3 millimeter plastic liner, duct taped, and transported to the Veolia Environmental Services Landfill Facility, formally known as Onyx Landfill in Buffalo, Minnesota.

To date, 266 properties have been identified as having asbestos contamination. Removal action has been completed at 253 properties, including the WMP Industrial Facility (HHID #1653). The remaining thirteen properties have either denied access or not responded to requests for access.

8. REFERENCES

Roy F. Weston (currently Weston Solutions, Inc). Residential Asbestos Remediation Work Plan for Western Minerals Products Site Minneapolis, Minnesota. 2001.

Roy F. Weston (currently Weston Solutions, Inc). Western Mineral Products Site Phase II Soil Sampling Report. 2001.

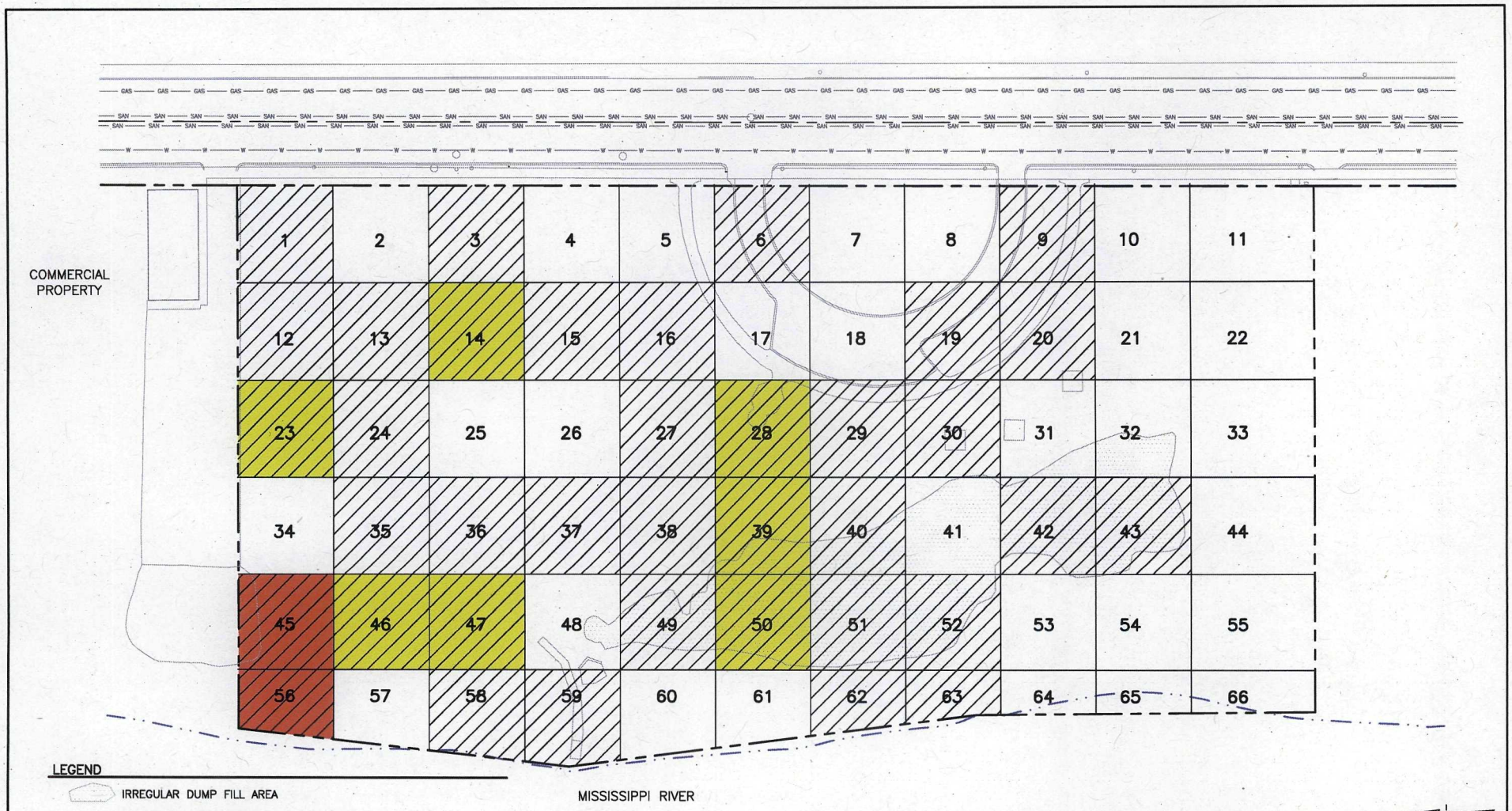
Roy F. Weston (currently Weston Solutions, Inc). Western Mineral Products Site Sampling and Quality Assurance Project Plan. 2001.

United States Environmental Protection Agency. Action Memorandum Request for a Time-Critical Removal Action Approval at the Western Mineral Products Site in Minneapolis, Hennepin County, Minnesota (Site ID # B5P2). September 21, 2000.

Weston Solutions, Inc. (WESTON). Site Assessment and Extent of Contamination for Gluek Park. 2004.

FIGURES

Site Map – Gluek Park Post Excavation Sample Results



LEGEND

IRREGULAR DUMP FILL AREA

1 GRID AREA INDENTIFIER

MAXIMUM DETECTED ASBESTOS FIBER PERCENTAGE REMAINING IN SOILS IS LESS THAN 1%

MAXIMUM DETECTED ASBESTOS FIBER PERCENTAGE REMAINING IN SOILS IS BETWEEN 1–10%

MAXIMUM DETECTED ASBESTOS FIBER PERCENTAGE REMAINING IN SOILS IS BETWEEN 10–20%

ALL REMAINING GRID AREAS INDICATED ASBESTOS FIBER L PERCENTAGE AT NON–DETECT

SOURCES:
MINNEAPOLIS PARK AND RECREATION BOARD, GLUEK PARK DEVELOPMENT SITE IMPROVEMENTS AND DIMENSIONS PLAN. JUNE 10, 1987.
MINNEAPOLIS PARK AND RECREATION BOARD, GLUEK PARK DEVELOPMENT EXISTING CONDITIONS AND REMOVALS PLAN. JANUARY 10, 1983.

N

0 50'
SCALE

FIGURE 1

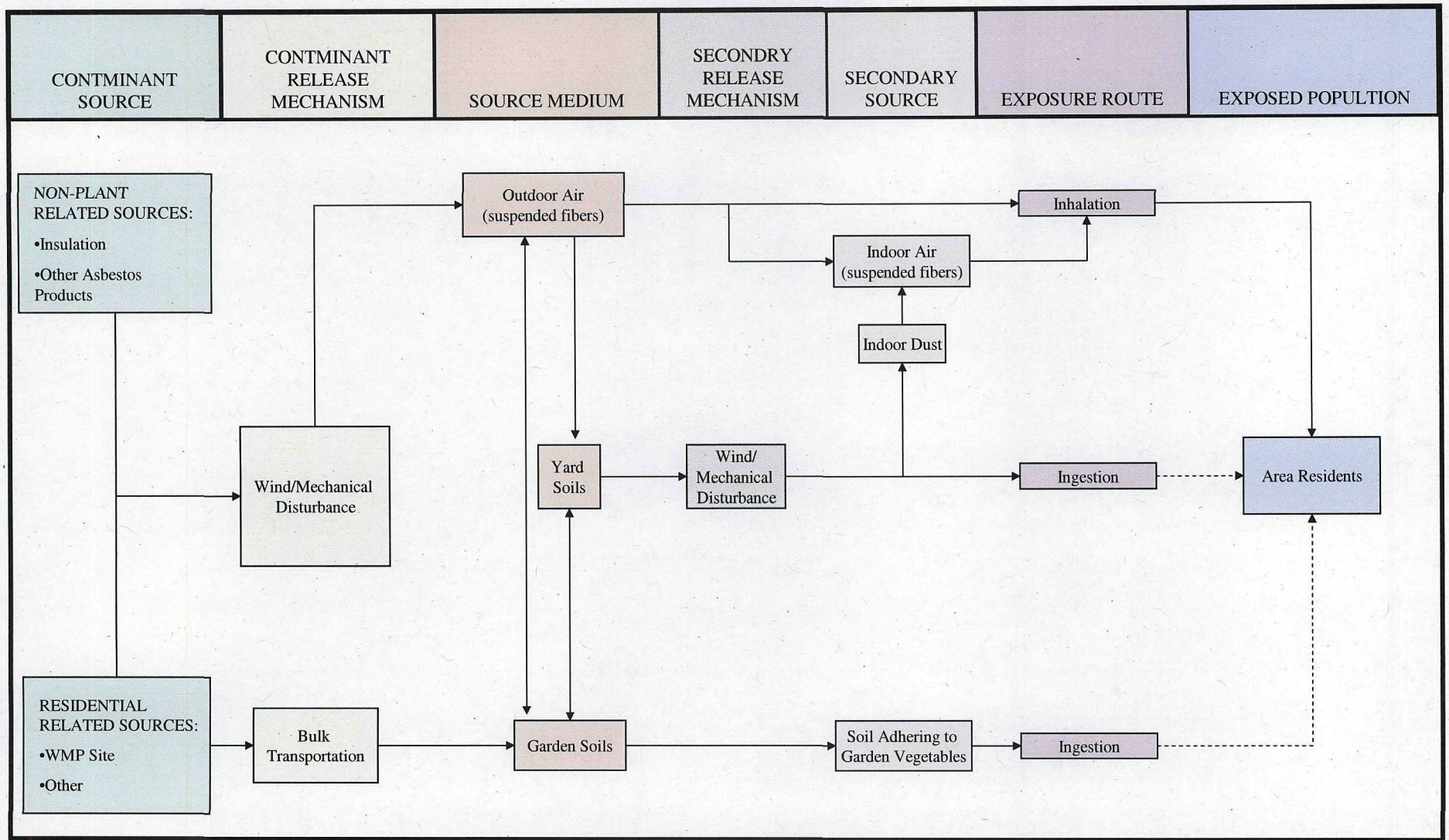
SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM
U.S. EPA CONTRACT No. EP–S5–06–04
TDD No. S05–0003–0609–038
DOCUMENT CONTROL No. 038–2A–AAGW

RESULTS OF POST EXCAVATION SOIL SAMPLING – GLUEK PARK
WESTERN MINERAL PRODUCTS PHASE II
1926 MARSHALL STREET NE
Minneapolis, Minnesota

J:\CAD93\2003\230103.dwg

ATTACHMENT A

Conceptual Site Exposure Model



WESTON SOLUTIONS
Restoring Resource Efficiency

20 North Wacker Drive
Suite 1210
Chicago, Illinois 60606

U.S. EPA Region V
Superfund Technical Assessment and Response Team
Contract No. 68-00-W-119

LEGEND

→ Pathway is potentially complete and considered significant; qualitative evaluation

- - - → Pathway is potentially complete, but not considered significant; qualitative evaluation

ATTACHMENT: A **TITLE:** Conceptual Site Exposure Model

SITE: Western Mineral Products

CITY: Minneapolis **STATE:** MN

TDD: S05-0609-038 **DCN:** 038-2A-AAGV

DATE: 23 January 2007

ATTACHMENT B

Example Soil Sampling Forms

Attachment B1: Soil Sampling Form (Short Version)

Soil Sampling Form

Western Mineral Products Residential Cleanup Site

WO#: 12634-001-002-0135

Address: _____ Date: _____

Samplers: _____

Comments (weather, temp, etc.) : _____

Sample ID	Time	Description of area sampled	Sample Appearance

Sample Location Sketch

Attachment B2: Soil Sampling Form (Long Version)

Soil Sampling Form

Western Mineral Products Residential Cleanup Site

WO#: ______________________________

Address: ____________________________ Date: ______________________________

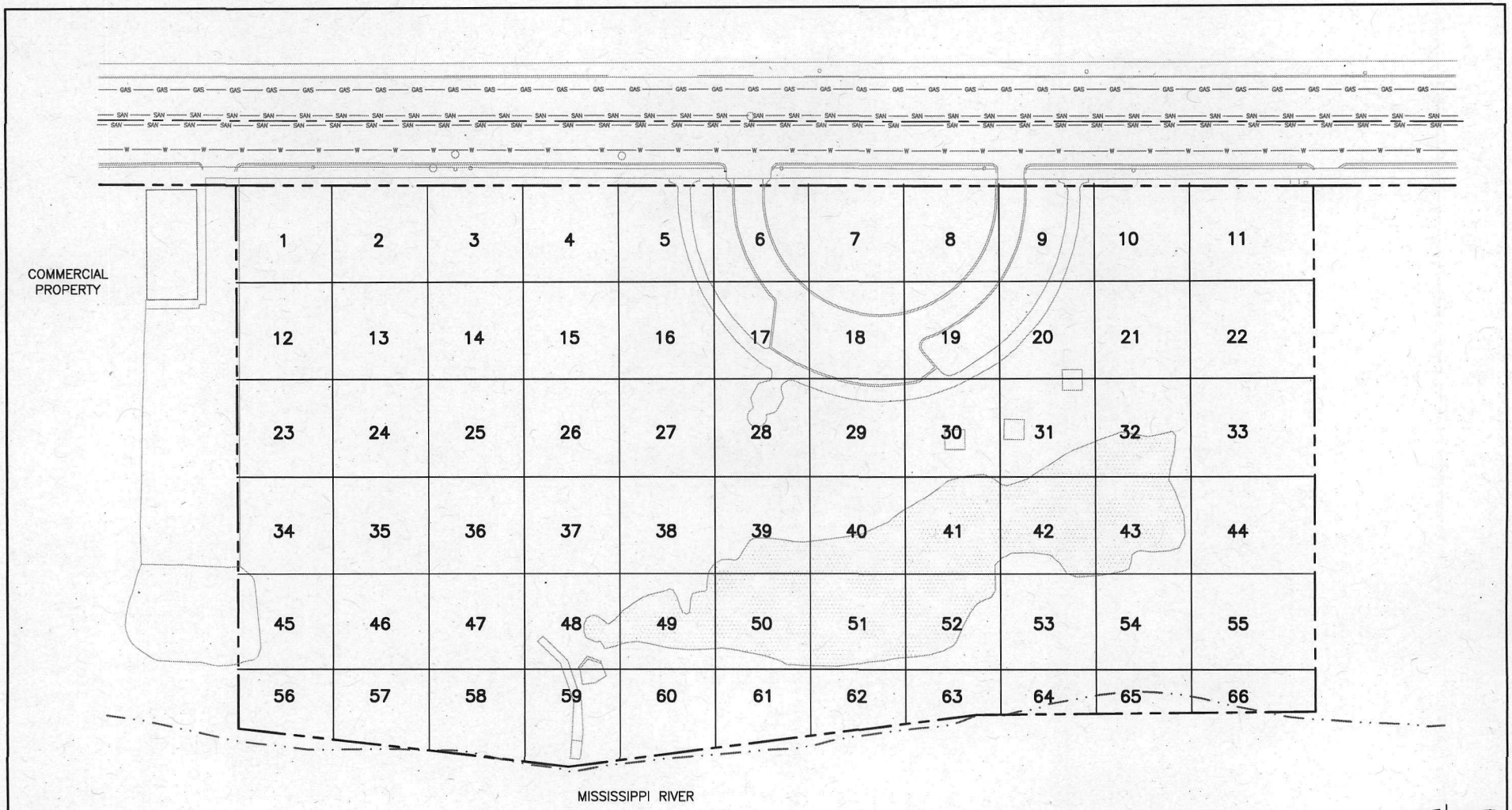
Samplers: ____

Comments (weather, temp, etc.) : ____

____

____

Sample ID	Time	Description of area sampled	Sample Appearance



LEGEND

IRREGULAR DUMP FILL AREA

1 GRID AREA INDENTIFIER

SOURCES:
MINNEAPOLIS PARK AND RECREATION BOARD, GLUEK PARK DEVELOPMENT SITE IMPROVEMENTS AND DIMENSIONS PLAN. JUNE 10, 1987.
MINNEAPOLIS PARK AND RECREATION BOARD, GLUEK PARK DEVELOPMENT EXISTING CONDITIONS AND REMOVALS PLAN. JANUARY 10, 1983.

0 50'
SCALE

ATTACHMENT B3

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM
U.S. EPA CONTRACT No. EP-S5-06-04
TDD No. S05-0003-0609-038
DOCUMENT CONTROL No. 038-2A-AAGW

RESULTS OF POST EXCAVATION SOIL SAMPLING – GLUEK PARK
WESTERN MINERAL PRODUCTS PHASE II
1926 MARSHALL STREET NE
Minneapolis, Minnesota

J:\CAD93\200\23003.dwg

ATTACHMENT C

Chains-of-Custody

Weston Solutions, Inc. **COC # 5053**

Chain of Custody Record

Work Number:	**Project Name:**
12634-001-001-0541-00	Western Mineral Products

Samplers: G. Letts

Sample ID	Date	Time	Comp.	Grab	Air	Station Location	Quantity	Analyte: PLM	Analyte: SOIL TEM	Analyte: PCM	Remarks:
SP-083105-PE322B	10/6/2005	1510	X			HHID # 322, Investigation	1	X			Grid 15 SE Section
SP-100605-PE322A	10/6/2005	1510	X			HHID # 322, Investigation	1	X			Grid 15 SW Section
SP-100605-PE322B	10/6/2005	1515	X			HHID # 322, Investigation	1	X			Grid 15 NW Section
SP-100605-PE322C	10/6/2005	1520	X			HHID # 322, Investigation	1	X			Grid 15 NE Section
ST-100605-PE322A	10/6/2005	1525	X			HHID # 322, Investigation	1		X		Grid 15
SP-100605-PE322D	10/6/2005	1529	X			HHID # 322, Investigation	1	X			Grid 14 SW Section
SP-100605-PE322E	10/6/2005	1532	X			HHID # 322, Investigation	1	X			Grid 14 SE Section
SP-100605-PE322F	10/6/2005	1535	X			HHID # 322, Investigation	1	X			Grid 14 NE Section
ST-100605-PE322B	10/6/2005	1540				HHID # 322, Investigation			X		Grid 14

3-Day Turnaround

Contact Michael Castillo:
612-706-0645
email: michael.castillo@westonsolutions.com
Invoice to WESTON, Chicago
Att: Rick Mehl

Relinquished By: *(Signature)*	Date/Time	Received By: *(Signature)*	Date/Time
Relinquished By: *(Signature)*	Date/Time	Received By: *(Signature)*	Date/Time
Relinquished By: *(Signature)*	Date/Time	Received By: *(Signature)*	Date/Time

Ship To:
FedEx to STAT Analysis Chicago, IL

Airbill Number
8485 1275 8844
Chain of Custody Seal Numbers
Custody #8844

Weston Solutions, Inc.

COC # S6026

Chain of Custody Record

Work Number:	**Project Name:**
12767-077-010-0606	Western Mineral Products
Samplers: V. Rice	

									Analyte:				
Sample ID	**Date**	**Time**	Comp.	Grab	Air	**Station Location**	Quantity	PLM	SOIL TEM	PCM	**Remarks:**
SP-092806-PE322A	9/28/2006	16:35	X			HHID # 322, Investigation	1	X			GRID 29, NE
SP-092806-PE322B	9/28/2006	16:36	X			HHID # 322, Investigation	1	X			GRID 29, SE
SP-092806-PE322C	9/28/2006	16:37	X			HHID # 322, Investigation	1	X			GRID 29, NW
SP-092806-PE322D	9/28/2006	16:38	X			HHID # 322, Investigation	1	X			GRID 29, SW
SP-092806-PE322E	9/28/2006	16:39	X			HHID # 322, Investigation	1	X			GRID 30, NE
SP-092806-PE322F	9/28/2006	16:40	X			HHID # 322, Investigation	1	X			GRID 30, NW
ST-092806-PE322A	9/28/2006	16:41	X			HHID # 322, Investigation	1	X			GRID 29 TEM
ST-092806-PE322B	9/28/2006	16:42	X			HHID # 322, Investigation	1	X			GRID 30 TEM

3-Day Turnaround

Contact: Twunjala Bradley
847-621-4265
email: Twunjala.Bradley@westonsolutions.com
Invoice to WESTON, Chicago
Att: Rick Mehl

Relinquished By: *(Signature)*	Date/Time	Received By: *(Signature)*	Date/Time
Relinquished By: *(Signature)*	Date/Time	Received By: *(Signature)*	Date/Time
Relinquished By: *(Signature)*	Date/Time	Received By: *(Signature)*	Date/Time

Ship To:
FedEx to STAT Analysis Chicago, IL

Airbill Number
8556 7418 8902
Chain of Custody Seal Numbers
Custody #8902

ATTACHMENT D

STAT Analysis Corporation TEM and PLM Certificates of Accreditation to ISO/IEC 17025:1999

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

May 25, 2006

Dr. Surendra N. Kumar
STAT Analysis Corporation
2201 W. Campbell Park Dr.
Chicago, IL 60612

NVLAP Lab Code: 101202-0

Dear Dr. Kumar:

I am pleased to inform you that continuing accreditation for specific test methods in Bulk Asbestos Fiber Analysis (PLM) is granted to your organization under the National Voluntary Laboratory Accreditation Program (NVLAP). This accreditation is effective until June 30, 2007, provided that your organization continues to comply with accreditation requirements contained in the NVLAP Procedures.

Your Certificate of Accreditation is enclosed along with a statement of your Scope of Accreditation. You may reproduce these documents in their entirety and announce your organization's accreditation status using the NVLAP logo in business publications, the trade press, and other business-oriented literature. Accreditation does not relieve your organization from observing and complying with any applicable existing laws and/or regulations.

We are pleased to have you participate in NVLAP and look forward to your continued association with this program. If you have any questions concerning your NVLAP accreditation, please direct them to Thomas R. Davis, Sr. Program Manager, Laboratory Accreditation Program, National Institute of Standards and Technology, 100 Bureau Dr. Stop 2140, Gaithersburg, MD 20899-2140; (301) 975-4016.

Sincerely,

Sally S. Bruce

Sally S. Bruce, Chief
Laboratory Accreditation Program

Enclosure(s)

NIST

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:1999

NVLAP LAB CODE: 101202-0

STAT Analysis Corporation
Chicago, IL

is recognized by the National Voluntary Laboratory Accreditation Program for conformance with criteria set forth in NIST Handbook 150:2001 and all requirements of ISO/IEC 17025:1999.
Accreditation is granted for specific services, listed on the Scope of Accreditation, for:

BULK ASBESTOS FIBER ANALYSIS

2006-07-01 through 2007-06-30
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology

NVLAP-01C (REV. 2005-05-19)

NVLAP® **National Voluntary Laboratory Accreditation Program**

SCOPE OF ACCREDITATION TO ISO/IEC 17025:1999

STAT Analysis Corporation
2201 W. Campbell Park Dr.
Chicago, IL 60612
Dr. Surendra N. Kumar
Phone: 312-733-0551 Fax: 312-733-2386
E-Mail: SKumar@STATAnalysis.com
URL: http://www.STATAnalysis.com

BULK ASBESTOS FIBER ANALYSIS (PLM) **NVLAP LAB CODE 101202-0**

NVLAP Code	*Designation / Description*
18/A01	EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples

2006-07-01 through 2007-06-30
Effective dates

For the National Institute of Standards and Technology

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

May 25, 2006

Dr. Surendra N. Kumar
STAT Analysis Corporation
2201 W. Campbell Park Dr.
Chicago, IL 60612

NVLAP Lab Code: 101202-0

Dear Dr. Kumar:

I am pleased to inform you that continuing accreditation for specific test methods in Airborne Asbestos Fiber Analysis (TEM) is granted to your organization under the National Voluntary Laboratory Accreditation Program (NVLAP). This accreditation is effective until June 30, 2007, provided that your organization continues to comply with accreditation requirements contained in the NVLAP Procedures.

Your Certificate of Accreditation is enclosed along with a statement of your Scope of Accreditation. You may reproduce these documents in their entirety and announce your organization's accreditation status using the NVLAP logo in business publications, the trade press, and other business-oriented literature. Accreditation does not relieve your organization from observing and complying with any applicable existing laws and/or regulations.

We are pleased to have you participate in NVLAP and look forward to your continued association with this program. If you have any questions concerning your NVLAP accreditation, please direct them to Thomas R. Davis, Sr. Program Manager, Laboratory Accreditation Program, National Institute of Standards and Technology, 100 Bureau Dr. Stop 2140, Gaithersburg, MD 20899-2140; (301) 975-4016.

Sincerely,

Sally S. Bruce

Sally S. Bruce, Chief
Laboratory Accreditation Program

Enclosure(s)

NIST

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:1999

NVLAP LAB CODE: 101202-0

STAT Analysis Corporation
Chicago, IL

is recognized by the National Voluntary Laboratory Accreditation Program for conformance with criteria set forth in NIST Handbook 150:2001 and all requirements of ISO/IEC 17025:1999.
Accreditation is granted for specific services, listed on the Scope of Accreditation, for:

AIRBORNE ASBESTOS FIBER ANALYSIS

2006-07-01 through 2007-06-30
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology

NVLAP® **National Voluntary Laboratory Accreditation Program**

SCOPE OF ACCREDITATION TO ISO/IEC 17025:1999

STAT Analysis Corporation
2201 W. Campbell Park Dr.
Chicago, IL 60612
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Phone: 312-733-0551 Fax: 312-733-2386
E-Mail: SKumar@STATAnalysis.com
URL: http://www.STATAnalysis.com

AIRBORNE ASBESTOS FIBER ANALYSIS (TEM) **NVLAP LAB CODE 101202-0**

NVLAP Code	*Designation / Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

2006-07-01 through 2007-06-30
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology

ATTACHMENT E

Asbestos (bulk) by PLM NIOSH Manual of Analytical Methods Fourth Edition 81594

ASBESTOS (bulk) by PLM 9002

various MW: various CAS: 1332-21-4 RTECS: C16475000

METHOD: 9002, Issue 2 **EVALUATION: PARTIAL** **Issue 1: 15 May 1989**
Issue 2: 15 August 1994

EPA Standard (Bulk): 1% **PROPERTIES:** solid, fibrous, crystalline, anisotropic

SYNONYMS [CAS #]: actinolite [77536-66-4], or ferroactinolite [15669-07-5]; amosite [12172-73-5]; anthophyllite [77536-67-5]; chrysotile [12001-29-5]; serpentine [18786-24-8]; crocidolite [12001-28-4]; tremolite [77536-68-6]; amphibole.

SAMPLING		MEASUREMENT	
BULK SAMPLE:	1 to 10 grams	**TECHNIQUE:**	MICROSCOPY, STEREO AND POLARIZED LIGHT, WITH DISPERSION STAINING
SHIPMENT:	seal securely to prevent escape of asbestos	**ANALYTE:**	*actinolite asbestos, amosite,* anthophyllite asbestos, chrysotile, crocidolite, tremolite asbestos
SAMPLE STABILITY:	stable	**EQUIPMENT:**	microscope, polarized light; 100-400X dispersion staining objective, stereo microscope: 10-45X
BLANKS:	none required	**RANGE:**	1% to 100% asbestos
ACCURACY		**ESTIMATED LOD:**	<1% asbestos [1]
RANGE STUDIED:	<1% to 100% asbestos	**PRECISION:**	not determined
BIAS:	not determined		
PRECISION:	not determined		
ACCURACY:	not determined		

APPLICABILITY: this method is useful for the qualitative identification of asbestos and the semi-quantitative determination of asbestos content of bulk samples. The method measures percent asbestos as perceived by the analyst in comparison to standard area projections, photos, and drawings, or trained experience. The method is not applicable to samples containing large amounts of fine fibers below the resolution of the light microscope

INTERFERENCES: Other fibers with optical properties similar to the asbestos minerals may give positive interferences. Optical properties of asbestos may be obscured by coating on the fibers. Fibers finer than the resolving power of the microscope (ca. 0.3 µm) will not be detected. Heat and acid treatment may alter the index of refraction of asbestos and change its color.

OTHER METHODS: This method (originally designated as method 7403) is designed for use with NIOSH Methods 7400 (phase contrast microscopy) and 7402 (electron microscopy/EDS). The method is similar to the EPA bulk asbestos method [1].

REAGENTS:

1. Refractive index (RI) liquids for Dispersion Staining: high-dispersion (HD) series, 1.550, 1.605, 1.620.
2. Refractive index liquids: 1.670, 1.680, and 1.700.
3. Asbestos reference samples such as SRM #1866, available from the National Institute of Standards and Technology.*
4. Distilled Water (optional).
5. Concentrated HCl: ACS reagent grade.

* See SPECIAL PRECAUTIONS

EQUIPMENT:

1. Sample containers: screw-top plastic vials of 10- to 50-mL capacity.
2. Microscope, polarized light, with polarizer, analyzer, port for retardation plate, 360• graduated rotating stage, substage condenser with iris, lamp, lamp iris, and:
   a. Objective lenses: 10X, 20X, and 40X or near equivalent.
   b. Ocular lense: 10X minimum.
   c. Eyepiece reticle: crosshair.
   d. Dispersion staining objective lens or equivalent.
   e. Compensator plate: ca. 550 nm± 20 nm, retardation: "first order red" compensator.
3. Microscope slides: 75 mm x 25 mm.
4. Cover slips.
5. Ventilated hood or negative-pressure glove box.
6. Mortar and pestle: agate or porcelain.
7. Stereomicroscope, ca. 10 to 45X.
8. Light source: incandescent or fluorescent.
9. Tweezers, dissecting needles, spatulas, probes, and scalpels.
10. Glassine paper or clean glass plate.
11. Low-speed hand drill with coarse burr bit (optional).

SPECIAL PRECAUTIONS: Asbestos, a human carcinogen, should be handled only in an exhaust hood (equipped with a HEPA filter) [2]. Precautions should be taken when collecting unknown samples, which may be asbestos, to preclude exposure to the person collecting the sample and minimize the disruption to the parent material [3]. Disposal of asbestos-containing materials should follow EPA Guidelines [4].

SAMPLING:

1. Place 1 to 10 g of the material to be analyzed in a sample container.
   NOTE: For large samples (i.e., whole ceiling tiles) that are fairly homogenous, a representative small portion should be submitted for analysis. Sample size should be adjusted to ensure that it is representative of the parent material.
2. Make sure that sample containers are taped so they will not open in transit.
3. Ship the samples in a rigid container with sufficient packing material to prevent damage or sample loss.

SAMPLE PREPARATION:

4. Visually examine samples in the container and with a low-magnification stereomicroscope in a hood. (If necessary, a sample may be carefully removed from the container and placed on glassine transfer paper or clean glass plate for examination). Break off a portion of the sample and examine the edges for emergent fibers. Note the homogeneity of the sample. Some hard tiles can be broken, and the edges examined for emergent fibers. If fibers are found, make an estimate of the amount and type of fibers present, confirm fiber type (step 14) and quantify (step 15).
5. In a hood, open sample container and with tweezers remove small, representative portions of the sample.
   1. If there are obvious separable layers, sample and analyze each layer separately.

b. If the sample appears to be slightly inhomogeneous, mix it in the sample container with tweezers or a spatula before taking the portion of analysis. Alternatively, take small representative portions of each type of material and place on a glass slide.
c. On hard tiles that may have thin, inseparable layers, use a scalpel to cut through all the layers for a representative sample. Then cut it into smaller pieces after placing RI liquid on it before trying to reduce the thickness. Alternatively, use a low-speed hand drill equipped with a burr bit to remove material from hard tiles. Avoid excessive heating of the sample which may alter the optical properties of the material.
   NOTE: This type of sample often requires ashing or other specialized preparation, and may require transmission electron microscopy for detection of the short asbestos fibers which are characteristic of floor tiles.
d. If the sample has large, hard particles, grind it in a mortar. Do not grind so fine that fiber characteristics are destroyed.
e. If necessary, treat a portion of the sample in a hood with an appropriate solvent to remove binders, tars, and other interfering materials which may be present in the sample. Make corrections for the non-asbestos material removed by this process.
   NOTE: Other methods of sample preparation such as acid washing and sodium metaphosphate treatment and ashing may be necessary, especially to detect low concentrations of asbestos. If needed, use as described in Reference [1].

6. After placing a few drops of RI liquid on the slide, put a small portion of sample in the liquid. Tease apart with a needle or smash small clumps with the flat end of a spatula or probe, producing a uniform thickness or particles so that better estimates of projected area percentages can be made. Mix the fibers and particles on the slide so that they are as homogeneous as possible.
   NOTE: An even dispersion of sample should cover the entire area under the cover slip. some practice will be necessary to judge the right amount of material to place on the slide. Too little sample may not give sufficient information and too much sample cannot be easily analyzed.

CALIBRATION AND QUALITY CONTROL:

7. Check for contamination each day of operation. Wipe microscope slides and cover slips with lens paper before using. Check refractive index liquids. Record results in a separate logbook.
8. Verify the refractive indices of the refractive index liquids used once per week of operation. Record these checks in a separate logbook.
9. Follow the manufacturer's instructions for illumination, condenser alignment and other microscope adjustments. Perform these adjustments prior to each sample set.
10. Determine percent of each identified asbestos species by comparison to standard projections (Figure 1) [1]. If no fibers are detected in a homogeneous sample, examine at least two additional preparations before concluding that no asbestos is present.
11. If it appears that the preparation technique might not be able to produce a homogeneous or representative sample on the slide, prepare a duplicate slide and average the results. Occasionally, when the duplicate results vary greatly, it will be necessary to prepare additional replicate slides and average all the replicate results. Prepare duplicate slides of at least 10% of the samples analyzed. Average the results for reporting.
12. Analyze about 5% blind samples of known asbestos content.
13. Laboratories performing this analytical method should participate in the National Voluntary Laboratory Accreditation Program [5] or a similar interlaboratory quality control program. Each analyst should have complete formal training in polarized light microscopy and its application to crystalline materials. In lieu of formal training, laboratory training in asbestos bulk analysis under the direction of a trained asbestos bulk analyst may be substituted. Owing to the subjective nature of the method, frequent practice is essential in order to remain proficient in estimating projected area percentages.

QUALITATIVE ASSESSMENT:

14. Scan the slide to identify any asbestos minerals using the optical properties of morphology,

refractive indices, color, pleochroism, birefringence, extinction characteristics, sign of elongation, and dispersion staining characteristics.

NOTE: *Identification of asbestos using polarized light microscopy is unlike most other analytical* methods. The quality of the results is dependent on the skill and judgment of the analyst. This method does not lend itself easily to a step-wise approach. Various procedures devised by different analysts may yield equivalent results. The following step-wise procedure repeatedly utilizes the sample preparation procedure previously outlined.

a. Prepare a slide using 1.550 HD RI liquid. Adjust the polarizing filter such that the polars are partially crossed, with ca. 15• offset. Scan the preparation, examining the morphology for the presence of fibers. If no fibers are found, scan the additional preparations. If no fibers are found in any of the preparations, report that the sample does not contain asbestos, and stop the analysis at this point.

b. If fibers are found, adjust the polarizing filter such that the polars are fully crossed. If all of the fibers are isotropic (disappear at all angles of rotation) then those fibers are not asbestos. *Fibrous glass and mineral wool, which are common components of suspect samples, are* isotropic. If only isotropic fibers are found in the additional preparations, report no asbestos fibers detected, and stop the analysis.

c. If anisotropic fibers are found, rotate the stage to determine the angle of extinction. Except for tremolite-actinolite asbestos which has oblique extinction at 10-20•, the other forms of asbestos exhibit parallel extinction (Table 1). Tremolite may show both parallel and oblique extinction.

d. Insert the first order red compensator plate in the microscope and determine the sign of *elongation. All forms of asbestos have a positive sign of elongation except for crocidolite.* If the sign of elongation observed is negative, go to step "g."

   NOTE: To determine the direction of the sign of elongation on a particular microscope configuration, examine a known chrysotile sample and note the direction (NE-SW or NW-SE) of the blue coloration. Chrysotile has a positive sign of elongation.

e. Remove the first-order red compensator and uncross the polarizer. Examine under plane polarized light for blue and gold-brown Becke colors at the fiber-oil interface (i.e., index of refraction match). Becke colors are not always evident. Examine fiber morphology for twisted, wavy bundles of fibers which are characteristic of chrysotile. Twisted, ribbon-like morphology with cellular internal features may indicate cellulose fibers. It may be necessary to cross the polars partially in order to see the fibers if the index of refraction is an exact match at 1.550. If the fibers appear to have higher index of refraction, go to step "h," otherwise continue.

f. Identification of chrysotile. Insert the dispersion staining objective. Observation of dispersion staining colors of blue and blue-magenta confirms chrysotile. Cellulose, which is a common interfering fiber at the 1.550 index of refraction, will not exhibit these dispersion staining colors. If chrysotile is found, go to step 15 for quantitative estimation.

g. Identification of crocidolite. Prepare a slide in 1.700 RI liquid. Examine under plane-polarized light (uncrossed polars); check for morphology of crocidolite. Fibers will be straight, with rigid appearance, and may appear blue or purple-blue. Crocidolite is pleochroic, i.e., it will appear to change its color (blue or gray) as it is rotated through plane polarized light. Insert the dispersion staining objective. The central stop dispersion staining color are red magenta and blue magenta, however, these colors are sometimes difficult to impossible to see because of the opacity of the dark blue fibers. If observations above indicate crocidolite, go to step 15 for quantitative estimation.

h. Identification of amosite. Prepare a slide in 1.680 RI liquid. Observed the fiber morphology for amosite characteristics: straight fibers and fiber bundles with broom-like or splayed ends. If the morphology matches amosite, examine the fibers using the dispersion staining objective. Blue and pale blue colors indicate the cummingtonite form of amosite, and gold and blue colors indicate the grunerite form of amosite. If amosite is confirmed by this test, go to step 15 for quantitative estimation, otherwise continue.

i. Identification of anthophyllite-tremolite-actinolite. Prepare a slide in 1.605 HD RI liquid. Examine morphology for comparison to anthophyllite-tremolite-actinolite asbestos. The refractive indices for these forms of asbestos vary naturally within the species. Anthophyllite can be distinguished from actinolite and tremolite by its nearly parallel extinction. Actinolite has a light to dark green color under plane-polarized light and exhibits some pleochroism. For all

three, fibers will be straight, single fibers possibly with some larger composite fibers. Cleavage fragments may also be present. Examine using the central stop dispersion staining objective. Anthophyllite will exhibit central stop colors of blue and gold/gold-magenta; tremolite will exhibit pale blue and yellow; and actinolite will exhibit magenta and golden-yellow colors.

NOTE: In this refractive index range, wollastonite is a common interfering mineral with similar morphology including the presence of cleavage fragments. It has both positive and negative sign of elongation, parallel extinction, and central stop dispersion staining colors of pale yellow and pale yellow to magenta. If further confirmation of wollastonite versus anthophyllite is needed, go to step "j". If any of the above forms of asbestos were confirmed above, go to step 15 for quantitative estimation. If none of the tests above confirmed asbestos fibers, examine the additional preparations and if the same result occurs, report the absence of asbestos in this sample.

j. Wash a small portion of the sample in a drop of concentrated hydrochloric acid on a slide. Place the slide, with cover slip in place, on a warm hot plate until dry. By capillary action, place 1.620 RI liquid under the cover clip and examine the slide. Wollastonite fibers will have a "cross-hatched" appearance across the length of the fibers and will not show central stop dispersion colors. Anthophyllite and tremolite will still show their original dispersion colors.

NOTE: There are alternative analysis procedures to the step-wise approach outlined above which will yield equivalent results. Some of these alternatives are:

i. Perform the initial scan for the presence of asbestos using crossed polars as well as the first-order red compensator. This allows for simultaneous viewing of birefringent and amorphous materials as well as determine their sign of elongation. Some fibers which are covered with mortar may best be observed using this configuration.

ii. Some analysts prefer to mount their first preparation in a RI liquid different than any asbestos materials and conduct their initial examination under plane-polarized light.

iii. If alternative RI liquids are used from those specified, dispersion staining colors observed will also change. Refer to an appropriate reference for the specific colors associated with asbestos in the RI liquids actually used.

QUANTITATIVE ASSESSMENT:

15. Estimate the content of the asbestos type present in the sample using the 1.550 RI preparation. Express the estimate as an area percent of all material present, taking into account the loading and distribution of all sample material on the slide. Use Figure 1 as an aid in arriving at your estimate. If additional unidentified fibers are present in the sample, continue with the qualitative measurement (step 14).

    NOTE: Point-counting techniques to determine percentages of the asbestos minerals are not generally recommended. The point-counting method only produces accurate quantitative data when the material on the slide is homogeneous and has a uniform thickness, which is difficult to obtain [6]. The point-counting technique is, recommended by the EPA to determine the amount of asbestos in bulk [1]; however, in the more recent Asbestos Hazard Emergency Response Act (AHERA) regulations, asbestos quantification may be performed by a point-counting or equivalent estimation method [7].

16. Make a quantitative estimate of the asbestos content of the sample from the appropriate combination of the estimates from both the gross and microscopic examinations. If asbestos fibers are identified, report the material as "asbestos-containing". Asbestos content should be reported as a range of percent content. The range reported should be indicative of the analyst's precision in estimating asbestos content. For greater quantities use Figure 1 in arriving at your estimate.

EVALUATION OF METHOD:

The method is compiled from standard techniques used in mineralogy [8-13], and from standard laboratory procedures for bulk asbestos analysis which have been utilized for several years. These

techniques have been successfully applied to the analysis of EPA Bulk Sample Analysis Quality Assurance Program samples since 1982 [1,5]. However, no formal evaluation of this method, as written, has been performed.

REFERENCES:

[1] Perkins, R.L. and B.W. Harvey, U.S. Environmental Protection Agency. Test Method for the Determination of Asbestos in Bulk Building Materials. EPA/600/R-93/116 (June. 1993).
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[3] Jankovic, J.T. Asbestos Bulk Sampling Procedure, Amer. Ind. Hyg. Assoc. J., B-8 to B-10, (February, 1985).
[4] U.S. Environmental Protection Agency, "Asbestos Waste Management Guidance" EPA/530-SW-85-007, (May, 1985).
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[6] Jankovic, J.T., J.L. Clere, W. Sanderson, and L. Piacitelli. Estimating Quantities of Asbestos in Building Materials. National Asbestos Council Journal, (Fall, 1988).
[7] Title 40, Code of Federal Regulations, Part 763. Appendix A to Subpart F. Interim Method of the Determination of Asbestos in Bulk Insulation Samples, (April 15, 1988).
[8] Bloss, F. Donald, Introduction to the Methods of Optical Crystallography, Holt, Rinehart, & Winston, (1961).
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[10] Shelley, David, Optical Mineralogy, 2nd Ed., New York, Elsevier, (1985).
[11] Phillips, W.R. and D.T. Griffen, Optical Mineralogy, W. H. Freeman and Co., (1981).
[12] McCrone, Walter, The Asbestos Particle Atlas, Ann Arbor Science, Michigan, (1980).
[13] "Selected Silicate Minerals and their Asbestiform Varieties," Bureau of Mines Information Circular IC 8751, (1977).

METHOD WRITTEN BY:

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Table 1. Optical Properties of Asbestos Fibers (Continued)

			Central Stop Dispersion Staining Colors		
Mineral	Extinction	Sign of Elongation	RI Liquid	⊥ to Vibration	∥ to Vibration
Chrysotile	Parallel to fiber length	+ (length slow)	1.550 HD	Blue	Blue-magenta
Cummingtonite-Grunerite (Amosite) Cummingtonite Grunerite	Parallel to fiber length	+ (length slow)	1.670 Fibers subjected to high temperatures will not dispersion-stain. 1.680 1.680	Red magenta to blue pale blue blue	Yellow blue gold
Crocidolite (Riebeckite)	Parallel to fiber length	- (length fast)	1.700 1.680	Red magenta yellow	Blue-magenta pale yellow
Anthophyllite	Parallel to fiber length	+ (length slow)	1.605 HD 1.620 HD	Blue Blue-green	Gold to gold-magenta Golden-yellow
Tremolite-Actinolite	Oblique - 10 to 20• for fragments. Some composite fibers show extinction.	+ (length slow)	1.605 HD	Pale blue (tremolite) Yellow (actinolite)	Yellow (tremolite) Pale yellow (actinolite)

HD = high-dispersion RI liquid series.

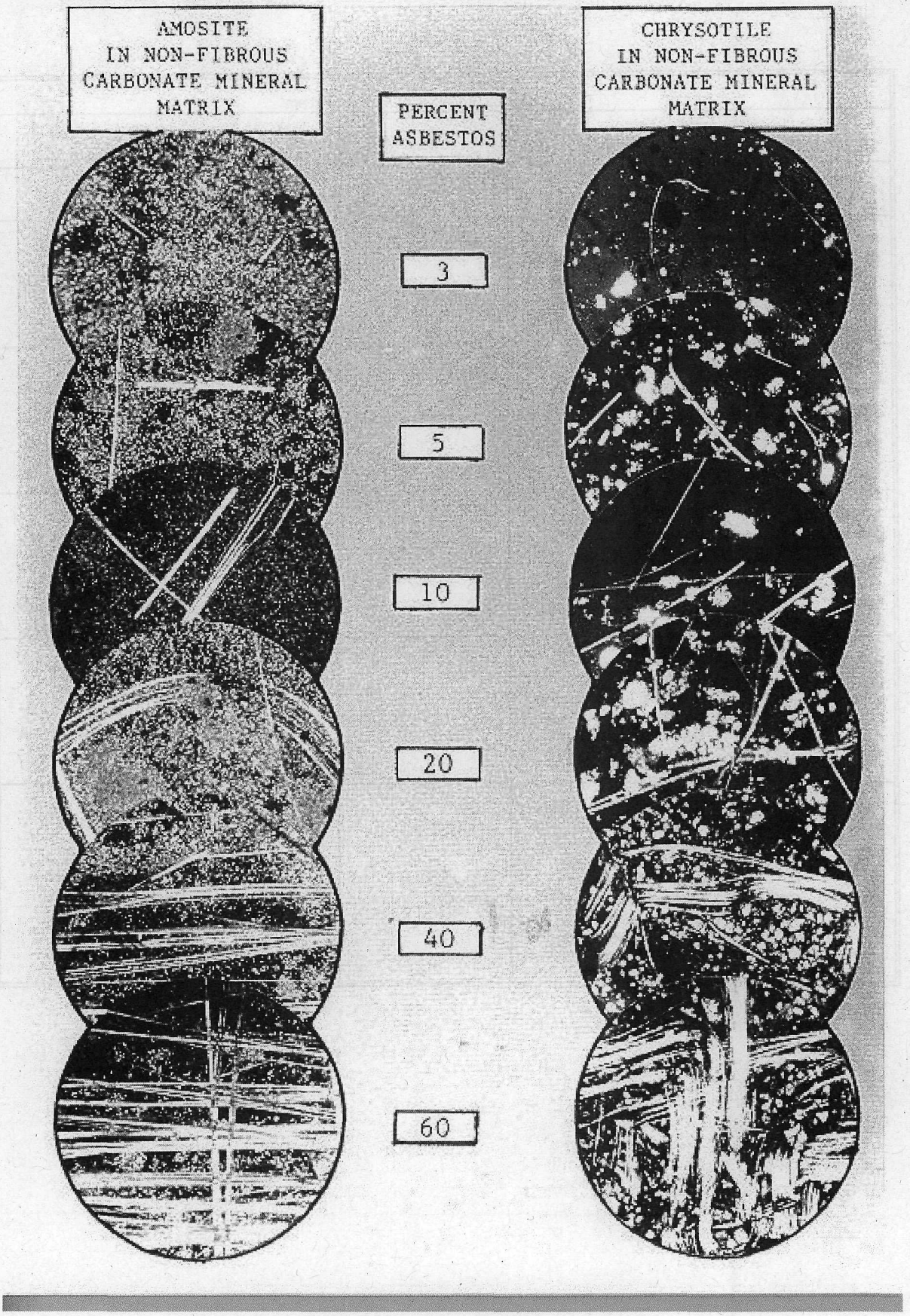


Figure 1. Percent estimate comparator

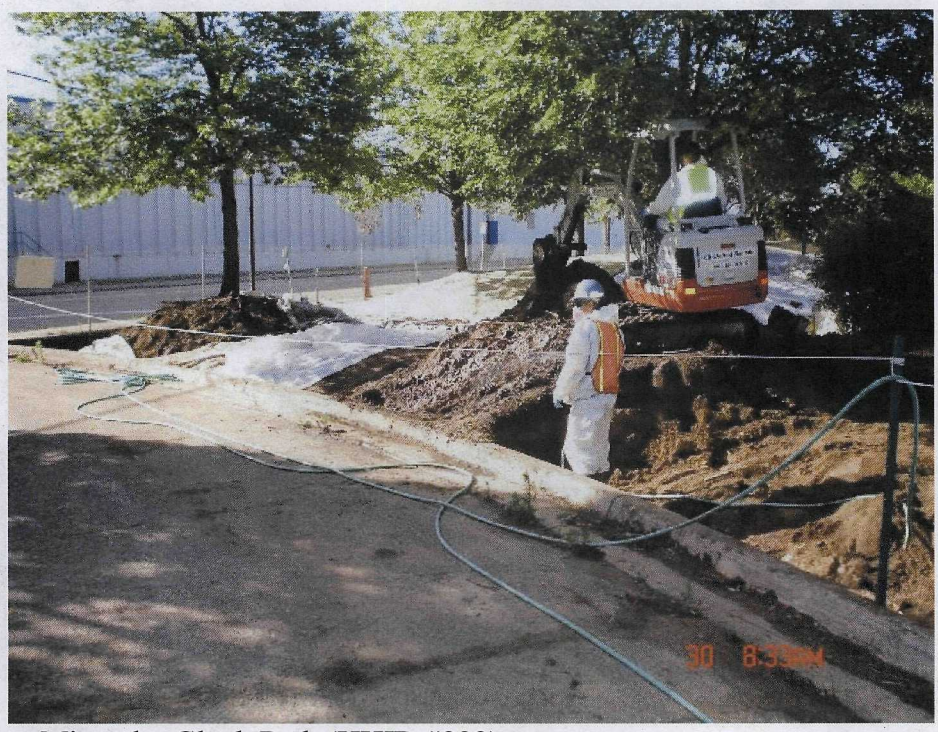
Table 1. Optical Properties of Asbestos Fibers

		Refractive Index (Approximate Values)		
Mineral	Morphology and Color	_ to Elongation	to Elongation	Birefringence
Chrysotile	Wavy fibers with kinks. Splayed ends on larger bundles. Colorless to light brown upon being heated. Nonpleochroic. Aspect ratio typically >10:1.	1.54	1.55	0.002 - 0.014
Cummingtonite-Grunerite (Amosite)	Straight fibers and fiber bundles. Bundle ends appear broom-like or splayed. Colorless to brown upon heating. May be weakly pleochroic. Aspect ratio typically >10:1.	1.67	1.70	0.02 - 0.03
Crocidolite (Riebeckite)	Straight fibers and fiber bundles. Longer fibers show curvature. Splayed ends on bundles. Characteristic blue color. Pleochroic. Aspect ratio typically >10:1.	1.71	1.70	0.014 - 0.016 Interference colors may be masked by blue color.
Anthophyllite	Straight fibers and fiber bundles. Cleavage fragments may be present. Colorless to light brown. Nonpleochroic to weakly pleochroic. Aspect ratio generally <10:1.	1.61	1.63	0.019 - 0.024
Tremolite-Actinolite	Straight and curved fibers. Cleavage fragments common. Large fiber bundles show splayed ends. Tremolite is colorless. Actinolite is green and weakly to moderately pleochroic. Aspect ratio generally <10:1.	1.60 - 1.62 (tremolite) 1.62 - 1.67 (actinolite)	1.62 - 1.64 (tremolite) 1.64 - 1.68 (actinolite)	0.02 - 0.03

ATTACHMENT F

Photographic Documentation

ATTACHMENT F
Photographic Documentation



Site: Western Mineral – Gluek Park (HHID #322)
Photo Number: 1 **Date:** June 30, 2005
Direction: Southeast **Photographer:** M. Castillo
Subject: Excavation activities and dust control measures.

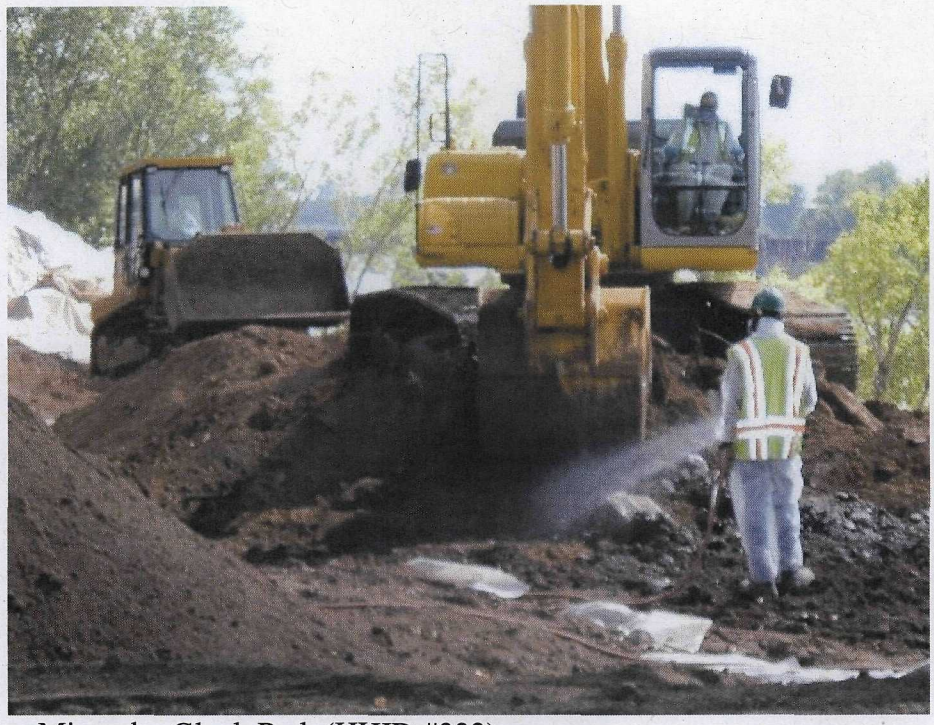
Site: Western Mineral – Gluek Park (HHID #322)
Photo Number: 2 **Date:** June 17, 2005
Direction: Northwest **Photographer:** M. Castillo
Subject: Certified Asbestos Inspector collecting PE samples from covered excavation area.

ATTACHMENT F (Continued)
Photographic Documentation

Site: Western Mineral – Gluek Park residential property (HHID #817)
Photo Number: 3 **Date:** August 2, 2005
Direction: South **Photographer:** M. Castillo
Subject: Excavation area and geoliner on north side of house.

Site: Western Mineral – Gluek Park (HHID #322)
Photo Number: 7 **Date:** August 29, 2006
Direction: South **Photographer:** M. Castillo
Subject: ERRS members setting geoliner prior to backfilling the excavation area.

ATTACHMENT F (Continued)
Photographic Documentation



Site: Western Mineral – Gluek Park (HHID #322)
Photo Number: 7
Direction: South
Subject: Dust control during excavation activities.

Date: August 29, 2006
Photographer: M. Castillo

Site: Western Mineral – Gluek Park (HHID #322)
Photo Number: 4
Direction: NA
Subject: Secured soil inside of a truck.

Date: August 11, 2006
Photographer: M. Castillo

ATTACHMENT G

Soil Sample Analytical Results

Attachment G
Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
Soil Sampling Analytical Results

HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	EOC	SP-101200-PRKB(SC)	10/12/2000	--	<1%	Actinolite	
322	EOC	SP-101200-PRKA(SC)	10/12/2000	--	6.7%	Actinolite	
322	EOC	SP-081403-EOC322M	8/14/2003	10:07	<1%	Tremolite	
322	EOC	SP-081403-EOC322F	8/14/2003	9:26	<1%	Tremolite	
322	EOC	SP-081403-EOC322G	8/14/2003	9:31	<1%	Tremolite	
322	EOC	SP-081403-EOC322H	8/14/2003	9:40	<1%	Tremolite	
322	EOC	SP-081403-EOC322I	8/14/2003	9:44	<1%	Tremolite	
322	EOC	SP-081403-EOC322J	8/14/2003	9:52	<1%	Tremolite	
322	EOC	SP-081403-EOC322D	8/14/2003	9:24	<1%	Tremolite	
322	EOC	SP-081403-EOC322L	8/14/2003	10:05	<1%	Tremolite	
322	EOC	SP-081403-EOC322C	8/14/2003	9:23	<1%	Tremolite	
322	EOC	SP-081403-EOC322N	8/14/2003	10:10	<1%	Tremolite	
322	EOC	SP-081403-EOC322O	8/14/2003	10:15	<1%	Tremolite	
322	EOC	SP-081403-EOC322P	8/14/2003	10:31	<1%	Tremolite	
322	EOC	SP-081403-EOC322Q	8/14/2003	10:32	<1%	Tremolite	
322	EOC	SP-081403-EOC322K	8/14/2003	9:54	<1%	Tremolite	
322	EOC	SP-081403-EOC322B	8/14/2003	9:20	<1%	Tremolite	
322	EOC	SP-081403-EOC322A	8/14/2003	9:15	<1%	Tremolite	
322	EOC	SP-081403-EOC322E	8/14/2003	9:26	<1%	Tremolite	
322	EOC	SP-082103-EOC322FF	8/21/2003	11:14	<1%	Tremolite	
322	EOC	SP-082103-EOC322W	8/21/2003	10:46	<1%	Tremolite	
322	EOC	SP-082103-EOC322X	8/21/2003	10:48	na	ND	
322	EOC	SP-082103-EOC322Y	8/21/2003	10:50	na	ND	
322	EOC	SP-082103-EOC322LL	8/21/2003	11:54	<1%	Tremolite	
322	EOC	SP-082103-EOC322KK	8/21/2003	11:51	ND	ND	
322	EOC	SP-082103-EOC322JJ	8/21/2003	11:28	10%	Tremolite	
322	EOC	SP-082103-EOC322II	8/21/2003	11:19	<1%	Tremolite	
322	EOC	SP-082103-EOC322GG	8/21/2003	11:15	<1%	Tremolite	
322	EOC	SP-082103-EOC322Z	8/21/2003	10:54	ND	ND	
322	EOC	SP-082103-EOC322EE	8/21/2003	11:12	ND	ND	
322	EOC	SP-082103-EOC322DD	8/21/2003	11:08	<1%	Tremolite	
322	EOC	SP-082103-EOC322CC	8/21/2003	11:03	ND	ND	
322	EOC	SP-082103-EOC322AA	8/21/2003	10:57	<1%	Tremolite	
322	EOC	SP-082103-EOC322V	8/21/2003	10:45	ND	ND	
322	EOC	SP-082103-EOC322HH	8/21/2003	11:16	<1%	Tremolite	
322	EOC	SP-082103-EOC322T	8/21/2003	10:37	ND	ND	

Attachment G (Continued)
Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
Soil Sampling Analytical Results

HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	EOC	SP-082103-EOC322S	8/21/2003	10:35	<1%	Tremolite	
322	EOC	SP-082103-EOC322R	8/21/2003	10:32	ND	ND	
322	EOC	SP-082103-EOC322BB	8/21/2003	10:59	ND	ND	
322	EOC	SP-082103-EOC322U	8/21/2003	10:40	ND	ND	
322	PE	BF-01	6/14/2005	14:00	ND	ND	Backfill Source - Offsite
322	PE	SP-061805-PE322D	6/18/2005	9:15	ND	ND	Grid 11 SE Quad
322	PE	SP-061805-PE322C	6/18/2005	9:25	ND	ND	Grid 11 SW Quad
322	PE	SP-061805-PE322B	6/18/2005	9:31	ND	ND	Grid 11 NE Quad
322	PE	SP-061805-PE322A	6/18/2005	9:34	ND	ND	Grid 11 NW Quad
322	PE	ST-061805-PE322A	6/18/2005	9:45	ND	ND	Grid 11
322	PE	SP-062005-PE322A	6/20/2005	13:25	ND	ND	Grid 10 NE Quad
322	PE	SP-062005-PE322B	6/20/2005	13:31	ND	ND	Grid 10 SE Quad
322	PE	ST-062205-PE322A	6/22/2005	13:10	ND	ND	Grid 10
322	PE	SP-062205-PE322B	6/22/2005	13:16	ND	ND	Grid 10 SW Quad
322	PE	SP-062205-PE322A	6/22/2005	13:15	ND	ND	Grid 10 NW Quad
322	PE	SP-063005-PE322A	6/30/2005	8:25	ND	ND	Grid 09 East half of Curve Section
322	PE	ST-070805-PE322A	6/30/2005	18:46	<1%	Chrysotile/Temolite	Grid 09, 19, 20 Curve Section
322	PE	SP-070805-PE322A	7/8/2005	18:45	ND	ND	Grid 19, 20 West half of curve
322	PE	SP-071305-PE322A	7/13/2005	13:15	ND	ND	Grid 08 SE Quad
322	PE	SP-071305-PE322B	7/13/2005	13:20	ND	ND	Grid 08 NE Quad
322	PE	SP-071505-PE322A	7/15/2005	8:05	ND	ND	Grid 07 SE Quad
322	PE	SP-071505-PE322B	7/15/2005	8:10	ND	ND	Grid 07 NE Quad
322	PE	SP-071805-PE322A	7/18/2005	13:05	ND	ND	Grid 06 SE Quad
322	PE	ST-071905-PE322A	7/19/2005	13:10	<1%	Tremolite	Grid 06
322	PE	SP-071905-PE322A	7/19/2005	13:05	ND	ND	Grid 06 SW Quad
322	PE	ST-072105-PE322A	7/21/2005	8:15	ND	ND	Grid 08, Grid 19 NE side
322	PE	SP-072105-PE322A	7/21/2005	8:00	ND	ND	Grid 08 SW Quad
322	PE	SP-072105-PE322B	7/21/2005	8:10	ND	ND	Grid 09 NW Quad
322	PE	SP-072105-PE322C	7/21/2005	8:20	ND	ND	Grid 19 NE Quad
322	PE	SP-072205-PE322B	7/22/2005	7:55	ND	ND	Grid 07 NW Quad
322	PE	SP-072205-PE322A	7/22/2005	7:50	ND	ND	Grid 07 SW Quad
322	PE	ST-072205-PE322A	7/22/2005	8:05	ND	ND	Grid 07, Grid 18 E Quad
322	PE	SP-072205-PE322C	7/22/2005	8:00	ND	ND	Grid 18 E side

Attachment G (Continued)
Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
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HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	PE	SP-072605-PE322A	7/26/2005	8:10	ND	ND	Grid 20/21 E Corners
322	PE	SP-072705-PE322B	7/27/2005	8:03	ND	ND	Grid 22 SE Quad
322	PE	ST-072705-PE322A	7/27/2005	8:13	ND	ND	Grid 22
322	PE	SP-072705-PE322D	7/27/2005	9:09	ND	ND	Grid 22 SW Quad
322	PE	SP-072705-PE322C	7/27/2005	8:06	ND	ND	Grid 22 NW Quad
322	PE	SP-072705-PE322A	7/27/2005	7:58	ND	ND	Grid 22 NE Quad
322	PE	BF-02	7/28/2005	8:40	ND	ND	Backfill Source - Onsite
322	PE	ST-072805-PE322A	7/28/2005	18:56	ND	ND	Grid 33
322	PE	SP-072805-PE322D	7/28/2005	18:53	ND	ND	Grid 33 SE Quad
322	PE	SP-072805-PE322C	7/28/2005	18:47	ND	ND	Grid 33 NW Quad
322	PE	SP-072805-PE322A	7/28/2005	18:39	ND	ND	Grid 33 NE Quad
322	PE	SP-072805-PE322B	7/28/2005	18:43	ND	ND	Grid 33 SE Quad
322	PE	SP-080205-PE322A	8/2/2005	18:40	ND	ND	Grid 32 NW Quad
322	PE	SP-080205-PE322B	8/2/2005	18:45	ND	ND	Grid 32 SW Quad
322	PE	SP-080305-PE322A	8/3/2005	18:45	ND	ND	Grid 32 SE Quad
322	PE	SP-080405-PE322A	8/4/2005	13:25	ND	ND	Grid 32 NE Quad
322	PE	ST-080405-PE322A	8/4/2005	13:30	ND	ND	Grid 32
322	PE	SP-081505-PE322D	8/15/2005	18:37	ND	ND	Grid 21 NE Quad
322	PE	SP-081505-PE322G	8/15/2005	18:47	ND	ND	Grid 21 SW Quad
322	PE	SP-081505-PE322E	8/15/2005	18:40	ND	ND	Grid 21 SE Quad
322	PE	SP-081505-PE322C	8/15/2005	18:30	ND	ND	Grid 20 SW Quad
322	PE	SP-081505-PE322B	8/15/2005	18:25	ND	ND	Grid 20 NW Quad
322	PE	SP-081505-PE322A	8/15/2005	18:20	ND	ND	Grid 09/20 Sidewalk
322	PE	ST-081505-PE322B	8/15/2005	18:50	ND	ND	Grid 21
322	PE	ST-081505-PE322A	8/15/2005	18:33	ND	ND	Grid 20 and sidewalk
322	PE	SP-081505-PE322F	8/15/2005	18:43	ND	ND	Grid 21 NW Quad
322	PE	SP-081805-PE322A	8/18/2005	18:25	ND	ND	Grid 31 NE Quad
322	PE	SP-081805-PE322B	8/18/2005	18:28	ND	ND	Grid 31 SE Quad
322	PE	SP-081805-PE322C	8/18/2005	18:32	ND	ND	Grid 31 NW Quad
322	PE	SP-081805-PE322D	8/18/2005	18:35	ND	ND	Grid 31 SW Quad
322	PE	ST-081805-PE322A	8/18/2005	18:40	ND	ND	Grid 31
322	PE	SP-081905-PE322B	8/19/2005	18:30	ND	ND	Grid 30 SE Quad
322	PE	SP-081905-PE322C	8/19/2005	18:35	ND	ND	Grid 30 SW Quad
322	PE	SP-081905-PE322A	8/19/2005	18:25	ND	ND	Grid 30 NE Quad

Attachment G (Continued)
Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
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HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	PE	ST-081905-PE322A	8/19/2005	18:40	ND	ND	Grid 30
322	PE	ST-082405-PE322A	8/24/2005	18:11	ND	ND	Grid 5,6 Adjacent
322	PE	SP-082405-PE322A	8/24/2005	17:45	ND	ND	Grid 5,6 East Corners
322	PE	SP-082405-PE322B	8/24/2005	17:50	ND	ND	Grid 5 NE Quad
322	PE	SP-082405-PE322C	8/24/2005	17:53	ND	ND	Grid 5,6 West Corners
322	PE	SP-082405-PE322D	8/24/2005	17:55	ND	ND	Grid 5 NW Quad
322	PE	SP-082405-PE322E	8/24/2005	18:00	ND	ND	Grid 16,17 East Corners
322	PE	SP-082405-PE322F	8/24/2005	18:03	ND	ND	Grid 16 NE Quad
322	PE	SP-082405-PE322G	8/24/2005	18:07	ND	ND	Grid 16,17 Center Area
322	PE	SP-083005-PE322D	8/30/2005	18:41	ND	ND	Grid 4 NE Quad
322	PE	SP-083005-PE322C	8/30/2005	18:38	ND	ND	Grid 4 SW Quad
322	PE	SP-083005-PE322B	8/30/2005	18:34	ND	ND	Grid 4 NE Quad
322	PE	SP-083005-PE322A	8/30/2005	18:30	ND	ND	Grid 4 SE Quad
322	PE	ST-083005-PE322A	8/30/2005	18:45	ND	ND	Grid 4
322	PE	SP-083105-PE322A	8/31/2005	14:30	ND	ND	Grid 16 NW Section
322	PE	SP-083105-PE322B	8/31/2005	15:10	<1%	Tremolite	Grid 15 SE Quad
322	PE	ST-083105-PE322A	8/31/2005	14:45	<1%	Tremolite	Grid 16
322	PE	SP-090905-PE322A	9/9/2005	18:30	ND	ND	Grid 3 SE Quad
322	PE	SP-091905-PE322B	9/19/2005	18:25	ND	ND	Grid 3 NE Quad
322	PE	ST-091905-PE322A	9/19/2005	18:40	<1%	Tremolite	Grid 3
322	PE	SP-091905-PE322D	9/19/2005	18:35	ND	ND	Grid 3 SW Quad
322	PE	SP-091905-PE322C	9/19/2005	18:30	ND	ND	Grid 3 NW Quad
322	PE	SP-092005-PE322A	9/20/2005	18:35	ND	ND	Grid 2 SE Quad
322	PE	SP-092005-PE322B	9/20/2005	18:40	ND	ND	Grid 2 NE Quad
322	PE	SP-092005-PE322C	9/20/2005	18:45	ND	ND	Grid 2 SW Quad
322	PE	SP-092105-PE322B	9/21/2005	14:00	ND	ND	Grid 1 SE Quad
322	PE	SP-092105-PE322C	9/21/2005	14:03	ND	ND	Grid 1 NE Quad
322	PE	SP-092105-PE322A	9/21/2005	13:35	ND	ND	Grid 2 NW Quad
322	PE	ST-092105-PE322A	9/21/2005	14:10	ND	ND	Grid 2
322	PE	SP-092105-PE322D	9/21/2005	14:06	ND	ND	Grid 1 SW Quad
322	PE	ST-092205-PE322B	9/22/2005	8:07	<1%	Tremolite	Grid 12
322	PE	ST-092205-PE322A	9/22/2005	8:03	<1%	Tremolite	Grid 1
322	PE	SP-092205-PE322A	9/22/2005	7:45	ND	ND	Grid 1 NW Quad
322	PE	SP-092205-PE322B	9/22/2005	7:48	ND	ND	Grid 12 SE Quad

Attachment G (Continued)
Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
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HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	PE	SP-092205-PE322C	9/22/2005	7:52	ND	ND	Grid 12 NE Quad
322	PE	SP-092205-PE322D	9/22/2005	7:55	ND	ND	Grid 12 SW Quad
322	PE	SP-092205-PE322E	9/22/2005	8:00	ND	ND	Grid 12 NW Quad
322	PE	SP-092305-PE322A	9/23/2005	15:25	ND	ND	Grid 13 NE Quad
322	PE	SP-092305-PE322B	9/23/2005	15:30	ND	ND	Grid 13 NW Quad
322	PE	SP-092605-PE322F	9/26/2005	12:40	ND	ND	Grid 23 NE Quad
322	PE	ST-092605-PE322A	9/26/2005	12:45	<1%	Tremolite	Grid 13
322	PE	SP-092605-PE322B	9/26/2005	12:20	ND	ND	Grid 13 SW Quad
322	PE	SP-092605-PE322C	9/26/2005	12:25	ND	ND	Grid 24 SE Quad
322	PE	SP-092605-PE322D	9/26/2005	12:30	ND	ND	Grid 24 SW Quad
322	PE	SP-092605-PE322E	9/26/2005	12:35	ND	ND	Grid 23 SE Quad
322	PE	SP-092605-PE322A	9/26/2005	12:15	ND	ND	Grid 13 SE Quad
322	PE	SP-092705-PE322A	9/27/2005	7:55	ND	ND	Grid 24 NE Quad
322	PE	SP-092705-PE322B	9/27/2005	8:00	ND	ND	Grid 24 NW Quad
322	PE	ST-092705-PE322A	9/27/2005	8:05	<1%	Chrysotile	Grid 24
322	PE	ST-100405-PE322A	10/4/2005	14:40	1-2%	Tremolite	
322	PE	SP-100405-PE322A	10/4/2005	14:30	ND	ND	Grid 23 SW Quad
322	PE	SP-100405-PE322B	10/4/2005	14:35	ND	ND	Grid 23 NW Quad
322	PE	ST-100605-PE322B	10/6/2005	15:40	1-2%	Tremolite	Grid 14
322	PE	SP-100605-PE322A	10/6/2005	15:10	<1%	Tremolite	Grid 15 SW Quad
322	PE	SP-100605-PE322B	10/6/2005	15:15	<1%	Tremolite	Grid 15 NW Quad
322	PE	SP-100605-PE322C	10/6/2005	15:20	<1%	Tremolite	Grid 15 NE Quad
322	PE	SP-100605-PE322D	10/6/2005	15:29	<1%	Tremolite	Grid 14 SW Quad
322	PE	SP-100605-PE322E	10/6/2005	15:32	<1%	Tremolite	Grid 14 SE Quad
322	PE	SP-100605-PE322F	10/6/2005	15:35	<1%	Tremolite	Grid 14 NE Quad
322	PE	ST-100605-PE322A	10/6/2005	15:25	<1%	Tremolite	Grid 15
322	PE	SP-072106-PE322M	7/21/2006	8:16	1-2%	Tremolite	Grid 46 SE Section
322	PE	ST-072106-PE322F	7/21/2006	8:59	<1%	Tremolite	Grid 56
322	PE	ST-072106-PE322E	7/21/2006	8:52	ND	ND	Grid 57
322	PE	ST-072106-PE322A	7/21/2006	7:55	ND	ND	Grid 34
322	PE	ST-072106-PE322D	7/21/2006	8:22	ND	ND	Grid 46
322	PE	ST-072106-PE322C	7/21/2006	8:35	1-2%	Tremolite	Grid 45
322	PE	ST-072106-PE322B	7/21/2006	8:20	<1%	Tremolite	Grid 35
322	PE	SP-072106-PE322U	7/21/2006	8:57	ND	ND	Grid 56 S Half Section
322	PE	SP-072106-PE322T	7/21/2006	8:56	10-15%	Tremolite	Grid 56 N Half Section

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Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
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HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	PE	SP-072106-PE322S	7/21/2006	8:52	ND	ND	Grid 57 SW Section
322	PE	SP-072106-PE322R	7/21/2006	8:52	ND	ND	Grid 57 SW Section
322	PE	SP-072106-PE322Q	7/21/2006	8:50	ND	ND	Grid 57 NW Section
322	PE	SP-072106-PE322P	7/21/2006	8:48	ND	ND	Grid 57 SE Section
322	PE	SP-072106-PE322N	7/21/2006	8:18	ND	ND	Grid 46 NW Section
322	PE	SP-072106-PE322L	7/21/2006	8:15	ND	ND	Grid 46 NE Section
322	PE	SP-072106-PE322K	7/21/2006	8:30	ND	ND	Grid 45 SW Section
322	PE	SP-072106-PE322J	7/21/2006	8:28	15-20%	Tremolite	Grid 45 NW Section
322	PE	SP-072106-PE322I	7/21/2006	8:25	ND	ND	Grid 45 SE Section
322	PE	SP-072106-PE322H	7/21/2006	8:23	1-2%	Tremolite	Grid 45 NE Section
322	PE	SP-072106-PE322G	7/21/2006	8:10	ND	ND	Grid 35 SW Section
322	PE	SP-072106-PE322F	7/21/2006	8:08	ND	ND	Grid 35 NW Section
322	PE	SP-072106-PE322E	7/21/2006	8:06	ND	ND	Grid 35 SE Section
322	PE	SP-072106-PE322D	7/21/2006	8:05	ND	ND	Grid 35 NE Section
322	PE	SP-072106-PE322C	7/21/2006	7:53	ND	ND	Grid 34 SW Section
322	PE	SP-072106-PE322B	7/21/2006	7:50	ND	ND	Grid 34 SE Section
322	PE	SP-072106-PE322A	7/21/2006	7:45	ND	ND	Grid 34 NW Section
322	PE	SP-072106-PE322O	7/21/2006	8:20	ND	ND	Grid 46 SW Section
322	PE	SP-072906-PE322B	7/29/2006	7:31	ND	ND	Grid 36,SE Setion
322	PE	SP-072906-PE322A	7/29/2006	7:30	ND	ND	Grid 36, NE Section
322	PE	SP-072906-PE322C	7/29/2006	7:32	ND	ND	Grid 36, NW Section
322	PE	ST-072906-PE322A	7/29/2006	7:35	<1%	Tremolite	Grid 36
322	PE	SP-072906-PE322D	7/29/2006	7:33	ND	ND	Grid 36, SW Section
322	PE	SP-080706-PE322D	8/7/2006	18:51	ND	ND	Grid 25,SW Setion
322	PE	SP-080706-PE322E	8/7/2006	18:52	ND	ND	Grid 25,NE Setion
322	PE	ST-080706-PE322A	8/7/2006	18:47	ND	ND	Grid 14
322	PE	ST-080706-PE322B	8/7/2006	18:54	ND	ND	Grid 25
322	PE	SP-080706-PE322F	8/7/2006	18:53	ND	ND	Grid 25,NW Setion
322	PE	SP-080706-PE322C	8/7/2006	18:50	ND	ND	Grid 25,SE Setion
322	PE	SP-080706-PE322A	8/7/2006	18:45	ND	ND	Grid 14,SW Setion
322	PE	SP-080706-PE322B	8/7/2006	18:46	ND	ND	Grid 14,NW Setion
322	PE	SP-080906-PE322D	8/9/2006	7:34	ND	ND	Grid 47,SE Setion
322	PE	ST-080906-PE322B	8/9/2006	7:32	<1%	Tremolite	
322	PE	SP-080906-PE322E	8/9/2006	7:35	1-5%	ND	Grid 47,NE Setion
322	PE	SP-080906-PE322C	8/9/2006	7:32	ND	ND	Grid 47,SW Setion
322	PE	SP-080906-PE322B	8/9/2006	7:31	ND	ND	Grid 58,NE Setion

Attachment G (Continued)
Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
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HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	PE	SP-080906-PE322A	8/9/2006	7:30	ND	ND	Grid 58,SE Setion
322	PE	ST-080906-PE322A	8/9/2006	7:36	<1%	Tremolite	Grid 47
322	PE	SP-081506-PE322A	8/15/2006	17:20	ND	ND	Grid 28, SE half
322	PE	ST-081506-PE322A	8/15/2006	17:25	1-2% Trem <1%	Chrysotile & Tremolite	Grid 28
322	PE	SP-081506-PE322C	8/15/2006	17:30	ND	ND	Grid 27, SW
322	PE	SP-081506-PE322B	8/15/2006	17:21	ND	ND	Grid 28, NW half
322	PE	SP-081506-PE322D	8/15/2006	17:31	ND	ND	Grid 27, NW
322	PE	SP-081606-PE322A	8/16/2006	17:15	ND	ND	Grid 42, E
322	PE	SP-081606-PE322B	8/16/2006	17:16	ND	ND	Grid 41, E
322	PE	SP-081706-PE322B	8/17/2006	13:57	ND	ND	Grid 43, SE
322	PE	SP-081706-PE322A	8/17/2006	13:55	ND	ND	Grid 43, NE
322	PE	SP-082106-PE322F	8/21/2006	16:30	ND	ND	Grid 26, SE; Grid 15, SW
322	PE	ST-082106-PE322B	8/21/2006	16:40	<1%	Chrysotile	Grid 27, E; Grid 16, W
322	PE	SP-082106-PE322B	8/21/2006	7:15	ND	ND	Grid 27, SE
322	PE	SP-082106-PE322E	8/21/2006	16:33	ND	ND	Grid 26, SW
322	PE	SP-082106-PE322D	8/21/2006	16:31	ND	ND	Grid 25, Grid 15, NW
322	PE	SP-082106-PE322C	8/21/2006	16:30	ND	ND	Grid 26, NW
322	PE	ST-082106-PE322A	8/21/2006	7:15	<1%	Chrysotile&Trem	Grid 27
322	PE	SP-082106-PE322A	8/21/2006	7:15	ND	ND	Grid 27, NW
322	PE	ST-082206-PE322C	8/22/2006	19:00	<1%	Tremolite	Grid 49
322	PE	ST-082206-PE322B	8/22/2006	18:59	<1%	Tremolite	Grid 37
322	PE	ST-082206-PE322A	8/22/2006	18:58	ND	ND	Grid 48
322	PE	SP-082206-PE322K	8/22/2006	18:56	ND	ND	Grid 49, SW
322	PE	SP-082206-PE322B	8/22/2006	18:46	ND	ND	Grid 48, NE
322	PE	SP-082206-PE322L	8/22/2006	18:57	ND	ND	Grid 49, SE
322	PE	SP-082206-PE322A	8/22/2006	18:45	ND	ND	Grid 48, NW
322	PE	SP-082206-PE322J	8/22/2006	18:55	ND	ND	Grid 49, NE
322	PE	SP-082206-PE322C	8/22/2006	18:47	ND	ND	Grid 48, SW
322	PE	SP-082206-PE322D	8/22/2006	18:48	ND	ND	Grid 48, SE
322	PE	SP-082206-PE322E	8/22/2006	18:50	ND	ND	Grid 37, NW
322	PE	SP-082206-PE322F	8/22/2006	18:51	ND	ND	Grid 37, NE
322	PE	SP-082206-PE322G	8/22/2006	18:52	ND	ND	Grid 37, SW
322	PE	SP-082206-PE322H	8/22/2006	18:53	ND	ND	Grid 37, SE
322	PE	SP-082206-PE322I	8/22/2006	18:54	ND	ND	Grid 49, NW
322	PE	SP-082906-PE322A	8/29/2006	18:00	ND	ND	Grid 59, NE section

Attachment G (Continued)
Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
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HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	PE	SP-082906-PE322J	8/29/2006	18:09	ND	ND	Grid 61, S Section
322	PE	SP-082906-PE322H	8/29/2006	18:07	ND	ND	Grid 60, SW Section
322	PE	SP-082906-PE322G	8/29/2006	18:06	ND	ND	Grid 60, NW Section
322	PE	SP-082906-PE322F	8/29/2006	18:05	ND	ND	Grid 60, SE Section
322	PE	SP-082906-PE322E	8/29/2006	18:04	ND	ND	Grid 60, NE Section
322	PE	SP-082906-PE322D	8/29/2006	18:03	ND	ND	Grid 59, SW section
322	PE	SP-082906-PE322C	8/29/2006	18:02	ND	ND	Grid 59, NW section
322	PE	SP-082906-PE322B	8/29/2006	18:01	ND	ND	Grid 59, SE section
322	PE	SP-082906-PE322I	8/29/2006	18:08	ND	ND	Grid 61, N Section
322	PE	ST-082906-PE322A	8/29/2006	18:10	<1%	Tremolite	Grid 59
322	PE	ST-082906-PE322C	8/29/2006	18:12	ND	ND	Grid 61
322	PE	ST-082906-PE322B	8/29/2006	18:11	ND	ND	Grid 60
322	PE	SP-091106-PE322E	9/11/2006	8:24	ND	ND	Grid 39, NE
322	PE	SP-091106-PE322H	9/11/2006	8:27	1-5%	Tremolite	Grid 39, SW
322	PE	SP-091106-PE322F	9/11/2006	8:25	ND	ND	Grid 39, EE
322	PE	SP-091106-PE322G	9/11/2006	8:26	1-5%	Tremolite	Grid 39, NW
322	PE	SP-091106-PE322A	9/11/2006	8:20	ND	ND	Grid 38, NE
322	PE	SP-091106-PE322B	9/11/2006	8:21	ND	ND	Grid 38, S
322	PE	SP-091106-PE322D	9/11/2006	8:23	ND	ND	Grid 38, SW
322	PE	ST-091106-PE322C	9/11/2006	8:34	1-2%	Tremolite	Grid 50
322	PE	ST-091106-PE322B	9/11/2006	8:33	<1%	Tremolite	Grid 39
322	PE	ST-091106-PE322A	9/11/2006	8:32	<1%	Tremolite	Grid 38
322	PE	SP-091106-PE322L	9/11/2006	8:31	1-5%	Tremolite	Grid 50, SW
322	PE	SP-091106-PE322K	9/11/2006	8:30	1-5%	Tremolite	Grid 50, NW
322	PE	SP-091106-PE322J	9/11/2006	8:29	5-10%	Tremolite	Grid 50, SE
322	PE	SP-091106-PE322I	9/11/2006	8:28	1-5%	Tremolite	Grid 50, NE
322	PE	SP-091106-PE322C	9/11/2006	8:22	ND	ND	Grid 38, NW
322	PE	SP-091506-PE322F	9/15/2006	19:16	ND	ND	Grid 52, SE section
322	PE	ST-091506-PE322B	9/15/2006	19:20	<1%	Tremolite	Grids 52 and 63
322	PE	ST-091506-PE322A	9/15/2006	19:19	<1%	Tremolite	Grids 51 and 62
322	PE	SP-091506-PE322G	9/15/2006	19:17	ND	ND	Grid 51/63, NW section
322	PE	SP-091506-PE322E	9/15/2006	19:15	ND	ND	Grid 52, NE section
322	PE	SP-091506-PE322D	9/15/2006	19:14	ND	ND	Grid 51/62, SW section
322	PE	SP-091506-PE322C	9/15/2006	19:13	ND	ND	Grid 51/62, NW section
322	PE	SP-091506-PE322B	9/15/2006	19:12	ND	ND	Grid 51, SE section

Attachment G (Continued)
Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
Soil Sampling Analytical Results

HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	PE	SP-091506-PE322A	9/15/2006	19:11	ND	ND	Grid 51, NE section
322	PE	SP-091506-PE322H	9/15/2006	19:18	ND	ND	Grid 51/63, SW section
322	PE	ST-091806-PE322A	9/18/2006	18:16	<1%	Tremolite	Grid 42*
322	PE	SP-091806-PE322F	9/18/2006	18:15	ND	ND	Grid 53/64, SW
322	PE	SP-091806-PE322E	9/18/2006	18:14	ND	ND	Grid 53/64, NW
322	PE	SP-091806-PE322D	9/18/2006	18:13	ND	ND	Grid 53, SE
322	PE	SP-091806-PE322C	9/18/2006	18:12	ND	ND	Grid 53, NE
322	PE	SP-091806-PE322B	9/18/2006	18:11	ND	ND	Grid 42, SW
322	PE	SP-091806-PE322A	9/18/2006	18:10	ND	ND	Grid 42, NW
322	PE	ST-091806-PE322B	9/18/2006	18:17	ND	ND	Grid 53/64
322	PE	ST-092506-PE322E	9/25/2006	12:54	ND	ND	GRID 54
322	PE	SP-092506-PE322Q	9/25/2006	12:30	ND	ND	GRID 40, NW
322	PE	SP-092506-PE322R	9/25/2006	12:45	ND	ND	GRID 40, SW
322	PE	SP-092506-PE322S	9/25/2006	12:46	ND	ND	GRID 41, NE
322	PE	SP-092506-PE322T	9/25/2006	12:47	ND	ND	GRID 41, SE
322	PE	SP-092506-PE322U	9/25/2006	12:48	ND	ND	GRID 41, NW
322	PE	SP-092506-PE322V	9/25/2006	12:49	ND	ND	GRID 41, SW
322	PE	ST-092506-PE322A	9/25/2006	12:50	<1%	Tremolite	GRID 40
322	PE	ST-092506-PE322B	9/25/2006	12:51	ND	ND	GRID 41
322	PE	ST-092506-PE322D	9/25/2006	12:53	ND	ND	GRID 44
322	PE	SP-092506-PE322P	9/25/2006	12:29	ND	ND	GRID 40, SE
322	PE	ST-092506-PE322F	9/25/2006	12:55	ND	ND	GRID 55
322	PE	SP-092506-PE322A	9/25/2006	12:15	ND	ND	GRID 43, NW
322	PE	ST-092506-PE322C	9/25/2006	12:52	<1%	Tremolite	GRID 43
322	PE	SP-092506-PE322E	9/25/2006	12:19	ND	ND	GRID 54, NW
322	PE	SP-092506-PE322B	9/25/2006	12:16	ND	ND	GRID 43, SW
322	PE	SP-092506-PE322D	9/25/2006	12:18	ND	ND	GRID 54, SE
322	PE	SP-092506-PE322O	9/25/2006	12:28	ND	ND	GRID 40, NE
322	PE	SP-092506-PE322F	9/25/2006	12:20	ND	ND	GRID 54, SW
322	PE	SP-092506-PE322G	9/25/2006	12:21	ND	ND	GRID 44, NE
322	PE	SP-092506-PE322H	9/25/2006	12:22	ND	ND	GRID 44, SE
322	PE	SP-092506-PE322I	9/25/2006	12:23	ND	ND	GRID 44, NW
322	PE	SP-092506-PE322J	9/25/2006	12:24	ND	ND	GRID 44, SW
322	PE	SP-092506-PE322K	9/25/2006	12:25	ND	ND	GRID 55, NE
322	PE	SP-092506-PE322L	9/25/2006	12:26	ND	ND	GRID 55, SE
322	PE	SP-092506-PE322M	9/25/2006	12:27	ND	ND	GRID 55, NW

Attachment G (Continued)
Western Mineral Park Phase II Removal Action - Minneapolis, Minnesota
Soil Sampling Analytical Results

HHID #	Sample Phase	Sample ID	Date	Time	% Asbestos	Asbestos Type	Comments
322	PE	SP-092506-PE322N	9/25/2006	12:27	ND	ND	GRID 55, SW
322	PE	SP-092506-PE322C	9/25/2006	12:17	ND	ND	GRID 54, NE
322	PE	ST-092806-PE322B	9/28/2006	16:41	<1%	Tremolite	GRID 30
322	PE	SP-092806-PE322A	9/28/2006	16:35	ND	ND	GRID 29, NE
322	PE	SP-092806-PE322B	9/28/2006	16:36	ND	ND	GRID 29, SE
322	PE	SP-092806-PE322C	9/28/2006	16:36	ND	ND	GRID 29, NW
322	PE	SP-092806-PE322D	9/28/2006	16:38	ND	ND	GRID 29, SW
322	PE	SP-092806-PE322E	9/28/2006	16:39	ND	ND	GRID 30, NE
322	PE	SP-092806-PE322F	9/28/2006	16:40	ND	ND	GRID 30, NW
322	PE	ST-092806-PE322A	9/28/2006	16:41	<1%	Tremolite	GRID 29
817	EOC	SP-091505-EOC817G	9/15/2005	15:05	ND	ND	
817	EOC	SP-091505-EOC817F	9/15/2005	15:00	ND	ND	
817	EOC	SP-091505-EOC817E	9/15/2005	14:55	ND	ND	
817	EOC	SP-091505-EOC817D	9/15/2005	14:50	ND	ND	
817	EOC	SP-091505-EOC817C	9/15/2005	14:45	ND	ND	
817	EOC	SP-091505-EOC817B	9/15/2005	14:40	ND	ND	
817	EOC	SP-091505-EOC817A	9/15/2005	14:35	ND	ND	
817	PE	ST-100105-PE817B	10/1/2005	17:20	<1%	Chrysotile Tremolite	
817	PE	ST-100105-PE817A	10/1/2005	16:45	ND	ND	
817	PE	SP-100105-PE817C	10/1/2005	17:15	ND	ND	
817	PE	SP-100105-PE817B	10/1/2005	16:40	ND	ND	
817	PE	SP-100105-PE817A	10/1/2005	16:35	ND	ND	

NOTES:
HHID # - Household Identification Number.
EOC - Extent-of-contamination sample.
PE Post-excavation sample.
Sample ID - See sample identification description in Report.
% Asbestos - Percent asbestos fibers per bulk sample.
ND - Not detected.